



# ***NASA Disasters Program Airborne Assets Request Form***



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<https://disasters.nasa.gov>

<https://maps.disasters.nasa.gov>

The Disasters Applications area promotes the use of Earth observations to improve prediction of, preparation for, response to, and recovery from natural and technological disasters. Disaster applications and applied research on natural hazards support emergency preparedness leaders in developing mitigation approaches, such as early warning systems, and providing information and maps to disaster response and recovery teams.

# NASA Applied Science: Disasters



- The Program targets a spectrum of disasters, including floods, earthquakes, volcanoes, and landslides as well as combined hazards and cascading impacts.
- The Program has Coordinators at NASA HQ and across NASA Centers to enable generation and delivery of data and products to end-users during disaster event activations.
- Since NASA ***is not an operational agency***, the Disasters Program activates during an event upon an end-user request on a best efforts basis
  - Airborne support is provided on a best efforts basis, subject to aircraft/instrument and funding availability
- Products are shared directly to the end-user, posted to the Disasters website, and through the Disasters Geoportal.



**Earthquakes**



**Volcanoes**



**Landslides**



**Floods**



**Fires**



**Land Subsidence**

# Airborne Assets Request Form



## Airborne Asset Request Form Hayward Earthquake

### 1) What is the primary purpose of this mission?

In the event of a catastrophic Hayward earthquake, we would seek to collect data to measure surface displacement, possible toxic chemical release, fire extent and damage extent.

### 2) What are the potential data products?

InSAR and GPS ground displacement maps, multispectral measurements of chemical releases, multispectral and InSAR measurements of fire extents, and InSAR measurements of damage.

### 3) Who is making the request/how is mission being tasked?

The request has been made by California State stakeholders including California Geological Survey, CalOES, Cal NG, Caltrans, CalEPA, Alameda and Contra Costa Counties and other impacted local jurisdictions, FEMA Region 9 and the FAA.

### 4) What are the benefits from flying this mission?

- Supporting State of California earthquake response and recovery through providing situational awareness of earthquake displacement, subsequent fires and or landslide and debris flow damage, and recovery options
- Identifying areas of potential toxic release
- Identifying impacted critical infrastructure
- Supporting search and rescue operations
- Supporting evacuation planning

### 5) Is there a specific data format required or preferred to ingest the information?

Products can be provided in KML, ESRI web feature/map or image service or other OGC compliant format and GeoTIFF format. All products should include appropriate metadata. If the data is compressed for performance, consideration should be given to needed resolution for analysis.

### 6) Who specifically will utilize the information (end user POC)?

Immediate Response – displacement and liquefaction, critical infrastructure: California Earthquake Clearinghouse, California Geological Survey, CalOES, Cal NG, Caltrans, CalEPA, CDPH, CDWR, CDNR, Alameda and Contra Costa counties, other impacted local jurisdictions, FEMA Region 9, FAA, USGS, EPA, USCG, Search and Rescue teams  
Recovery – Same organizations – event liaison can work with specific organizations to identify individuals that will work with data as applicable to specific phases in the emergency management cycle.

### 7) Have there been similar applications of this type of remote sensing data in the past?

Similar data and process was used for Napa Earthquake in 2014.

### 8) What is the timeframe for needed capture and delivery of the information? Will multiple overflights be required?

As soon as possible. For UAVSAR, multiple passes will be requested by end users, possibly for multispectral as well. Passes will be requested for several days, up to perhaps months, until aftershocks reduce to acceptable levels for response and recovery operations.



### 9) Has an Area of Interest (AOI) been established?

Preliminary AOIs have been established in advance. Cascading hazards may expand initial AOIs.

### 10) Is any processing required for the information?

Yes. Specific details, (such as data resolution, derivative processing such as LIDAR to DEM), consideration of categorization of hazard severity values (scientific vs emergency management useful, etc..)TBD.

### 11) Where will the information be delivered and stored?

Information will be posted to the NASA Disasters Program GIS portal and pushed to users as applicable. Data can be downloaded from the portal.

### 12) Who is the NASA project lead and team for the capture and delivery of this information and oversee the entire workflow?

Name	Role
TBD	Project PI
TBD	Event Lead
TBD	HQ Emergency Management Lead
TBD	Stakeholder Liaison
TBD	Aircraft Lead
TBD	Aircraft SME
TBD	Science SME
TBD	Earthquake SME
TBD	SME/JPL Coordinator

### 13) What instrument(s) will be utilized?

UAVSAR, AVIRIS, other instruments as identified based on need.

### 14) What aircraft will be utilized?

Gulfstream P3 Aircraft, ER2

### 15) Is the aircraft available to be tasked?

TBD in consultation with aircraft lead.

### 16) Is the air space over the potential study area open?

It is anticipated that the air space over the potential study area will be open for this mission, to be coordinated with CalOES Air Coordination Group and the FAA. TFRs will be established as necessary to effect safe flying.

### 17) What is the anticipated funding source for this mission?

TBD, may include the following or combination thereof:

- Mission tasked from FEMA
- Mission tasked from CalOES
- NASA research funding
- NASA Disasters Program funding
- State or local funding



- Other federal funding
- Other sources as identified

### 18) Fee Schedule

TBD – worked out on case by case basis based on instrument/aircraft

### 19) Will there be a State agency Point of Contact throughout the operation period?

Yes. CalOES' Air Coordination Group (ACG) will be activated under such circumstances and available to coordinate all flight operations and mission tasks between federal and state partners and the requesting agencies. Liaisons from participating flight programs are expected to maintain contact with the ACG and may either send a liaison to the ACG or maintain telecom/computer communications.

# Things to think about...



- Need to socialize data and form ahead of time
  - Contra Costa and Alameda Counties, which will largely be affected by this event, will need to be familiar with the data and the process well ahead of a disaster
- Fits it with the notion of “trusted data”
  - Need to work with stakeholders regarding **how** to get the data
  - Need to document the process, not let it be stand alone
- NASA and other capabilities need to be familiarized to local stakeholders
  - Webinars
  - Articulated to high level decision makers, response users, and technical users
  - Work together to develop the trusted data and usage





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National Aeronautics and Space Administration



# Further Information

***<https://appliedsciences.nasa.gov/programs/disasters-program>***

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## **NASA Earth Science Applied Sciences Program**

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